Docket: 0756-1641

RESPONSE UNDER 37 CFR 1.116 - EXPEDITED PROCEDURE - EXAMINING GROUP 2823

Response 26/ (Rev)

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited ~~with~~ the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Box AF, Washington, D.C. 20231, on January 3, 2000.

Cameron S. Gilligan

1-8-99

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT application of)
Hongyong ZHANG et al.)
Serial No. 08/811,742) Group Art Unit: 2823
Filed: March 6, 1997) Examiner: S. Hawranek
For: SEMICONDUCTOR DEVICE AND)
FABRICATION METHOD OF)
THE SAME) Date: January 3, 2000

RESPONSE AFTER FINAL

Assistant Commissioner for Patents
Box AF
Washington, D.C. 20231
Sir:

The Office Action of August 3, 1999 was received and carefully reviewed. Reconsideration and withdrawal of the currently pending rejections are requested for the reasons advanced in detail below.

Filed concurrently herewith is a *Request for a Two Month Extension of Time* which extends the shortened statutory period of response to January 3, 2000. Accordingly, Applicants respectfully submit that this response is being timely filed.

Claims 5-12, 16, 19, and 26-66 are currently pending in the instant application, with claims 49-66 currently withdrawn from consideration.

Initially, Applicants noted that the Examiner has not acknowledged consideration of the references cited in the *Information Disclosure Statement* (IDS) filed on May 17, 1999 by Applicants. Therefore, it is respectfully requested that the Examiner evidence consideration of the references cited therein by providing a copy of the initialed Form PTO-1449 included with the May 17, 1999 IDS.

Claims 5-12, 16, 19, 26 and 27-48 are rejected under 35 U.S.C. §103(a) as being unpatentable over Oka (JP '915), in view of Liu et al. (U.S. '826) and further in view of Kuznetsov (Inst. Phys. Conf.), and in further view of Kumomi (U.S. '661). This rejection is traversed for the reasons advanced below.

Applicants contend that the recitation of the claimed ranges for the crystallization catalyst should be given patentable weight and should be considered sufficient to render the currently pending claims patentable over the cited art of record. As previously asserted, the reference to Oka is relied upon to teach a method of manufacturing device, and Liu et al. is relied upon to teach the use of an amorphous silicon area in the formation of a pixel electrode. The Examiner, however, puts no patentable weight on the recitation of the catalyst concentration since the Examiner asserts that the present specification contains no disclosure of either the critical nature of the claimed ranges of nickel concentration or any unexpected results arising therefrom over the prior art.

The present specification, however, clearly teaches the criticality of the claimed concentration on page 7, lines 15-26, as follows:

> "For nickel, it is confirmed that the temperature can be lowered when an amount of more than 1 x 10^{15} atoms/cm^3 is added. However, <u>because a shape of Raman spectroscopic spectrum becomes apparently different from that of simple substance of silicon when the</u>

added amount is more than 5 x 10^{19} atoms/cm^3, an actual usable range is considered to be from 1 x 10^{15} atoms/cm^3 to 1 x 10^{19} atoms/cm^3. When the nickel concentration is less than 1 x 10^{15} atoms/cm^3, the action as a catalyst for the crystallization decreases. Further, when the concentration is more than 5 x 10^{19} atoms/cm^3, NiSi is locally produced, losing the characteristics of semiconductor." (emphasis added)

Consequently, the present specification teaches the criticality in view of the catalytic effect and the characteristics of the semiconductor device of the claimed crystallization concentration range. Applicants contend that no cited reference discloses or suggests the criticality of this concentration, and thus, the claimed invention should be considered patentable.

Moreover, Applicants recognized a problem associated with the use of crystallization catalysts that was not appreciated by the prior art in view of the benefits provided by the catalysts. The recognition of a problem which was previously not known has been held sufficient to render claims directed to the solution to the problem unobvious. "If, as Appellants claim, there is no evidence of record that a person of ordinary skill in the art at the time of applicants' invention would have expected the problem in the IG-FET to exist at all, it is not proper to conclude that the invention which solves this problem, which is claimed as an improvement of the prior art device, would have been obvious to that hypothetical person of ordinary skill in the art." *In re Nomiya, Kohisa, and Matsumura*, 184 U.S.P.Q. 607, 612 (C.C.P.A. 1975).[1] In this case, the Examiner

---

[1] *Ex parte Campbell*, 211 U.S.P.Q. 575,576 (PTO Bd.App. 1981)("Although the solution to the problem would have been obvious once recognized, none of the prior art before us indicates any recognition of the existence of the problem.")

is relying upon four (4) references to support the rejection under §103 which, in this case, appears to support Applicants' contention that the references lack sufficient disclosure to render the subject invention obvious.

Furthermore, the present invention teaches to form a thin film having a crystallinity of desired crystal configuration at a desired portion by controlling a crystallization catalyst amount and a particular adding portion in order to provide a TFT having a higher mobility by causing the crystal growth direction to coincide with the carrier moving direction within the TFT, in that, the crystal growth is parallel with the substrate. However, no cited references mention or suggest the foregoing features. Therefore, Applicants contend that the rejection is not proper and should be withdrawn.

In view of the foregoing, it is respectfully requested that the rejections of record be reconsidered and withdrawn by the Examiner, that claims 5-12, 16, 19 and 26-48 be allowed and that the application be passed to issue. If a conference would expedite prosecution of the instant application, the Examiner is hereby invited to telephone the undersigned to arrange such a conference.

Respectfully submitted,

Jeffrey L. Costellia
Registration No. 35,483

SIXBEY, FRIEDMAN, LEEDOM & FERGUSON, P.C.
8180 Greensboro Drive, Suite 800
McLean, Virginia 22102
(703) 790-9110
(703) 883-0370 FAX

F:\DATA\wp2\CGILL\0756\1641\Response 01-03-00.wpd